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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/649,954

08/28/2003

Tae-Kyu Choi

P-0533

6257

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7590

08/18/2005

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EXAMINER

CAO, HUEDUNG X

ART UNIT

PAPER NUMBER

2821

DATE MAILED: 08/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/649,954

Applicant(s)

CHOI, TAE-KYU

Examiner

Huedung X. Cao

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07/18/05.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 8-11, 14-22 and 24-26 is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>07/18/05</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over PATEL (5,828,339) in view of NORO (US 6,549,177 B2).

As per claim 1, Patel teaches the claimed "antenna system of a radio communication terminal" comprising: "a directional antenna that transmits and receives an RF signal to and from a base station through a radio link" (Patel, the transmission and reception processing stages; figures 7-8); and "an amplifying unit that amplifies and filters the RF signal" (Patel, the integrated directional antenna includes the amplifiers 130, 134, 138, 154, 158; the band-pass filters 132, 140, 152, 156). It is noted that Patel does not explicitly disclose that an amplifying unit integrated on a same board together with the directional antenna. However, Noro teaches such amplifying unit integrated on a same board together with the directional antenna is well known in the art (Noro, figure 6A and 6B, the integrated directional antenna includes the low noise amplifier 172). It would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Noro, to configure Patel's antenna system as claimed because by using an amplifying unit integrated on a same

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board together with the directional antenna would help to achieve a small size and high performance of the electronic performance.

Claim 2 adds into claim 1 “the amplifying unit is integrated at an upper portion of an opposite side of the side where the directional antenna is formed” which Noro teaches in column 5, lines 22-28.

4. Claims 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over PATEL (5,828,339) in view of NORO (US 6,549,177 B2) and further in view of GOLDINGER et al. (6,812,824).

Claim 3 adds into claim 1 the structure of the amplifying unit which Patel and Noro do not explicitly teach. However, Goldinger teaches that such structure of the amplifying unit is well known in the art; specifically, Goldinger teaches the amplifying unit comprises: “a plurality of duplexers that separates a transmission path and a reception path of an RF signal” (Goldinger, the duplexers in figure 14 each of which acts, as the diplexer 618 of figure 6, as a diplexer for connecting a transmitter and a receiver to a common antenna; column 11, lines 4-9, 60-62); a sending end amplifying/filtering unit that amplifies and filters a transmitted RF signal (Goldinger, power amp 703, Tx bandpass filter 704); a receiving end amplifying/filtering unit that amplifies and filters a received RF signal (Goldinger, power amp 708, Tx bandpass filter 707); and a bias unit that separates an RF signal and a DC power inputted through a transmission line connected to a radio communication terminal (Goldinger, Bias Tee 906, 907; column 11, lines 18-30, 59-60). It would have been obvious to a person of ordinary skill in the art at

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the time the invention was made, in view of the teaching of Goldinger, to configure Patel's amplifying unit as claimed because such amplifying unit provides the separation of the received and transmitted signals with a proper power levels to perform the function of the antenna (Goldinger, column 9, lines 9-20).

Claim 4 adds into claim 3 "the amplifying unit further comprises a closed loop control circuit that detects a transmission output and generating/outputting a control signal" which Patel and Noro do not explicitly teach. However, Goldinger teaches that such "closed loop control circuit" is well known in the art (Goldinger, the microprocessor Tx control signals 610, 615 from the microprocessor 1001; column 10, lines 43-67). It would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Goldinger, to configure Patel's amplifying unit using a transmission control signal as claimed because such transmission control signal provides the transmitted signals with a proper power levels and frequency range to perform the transmitting function of the antenna (Goldinger, column 9, lines 25-34).

Claim 5 adds into claim 4 "the closed loop control circuit comprises: a coupling unit that branches a transmission output from a final end of the sending end amplifying/filtering unit; and a detection controller that detects a strength of power of the branched transmission output and generates a gain control signal" which Patel and Noro do not explicitly teach. However, Goldinger teaches that such closed loop control circuit is well known; specifically, "a coupling unit that branches a transmission output from a final end of the sending end amplifying/filtering unit" (Goldinger, the directional coupler 616, column 10, lines 60-64); and "a detection controller that detects a strength

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of power of the branched transmission output and generates a gain control signal” (Goldinger, the transmitting signal test 617 and the gain control signal 615; figure 6 and column 10, line 61 to column 11, line 3). It would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Goldinger, to configure Patel’s amplifying unit using a transmitting power control as claimed because such transmitting power control provides the transmitted signals with a proper power levels to perform the transmitting function of the antenna (Goldinger, column 9, lines 25-34).

Claim 6 adds into claim 3 “a band pass filter that passes only a signal of a specific band” which Patel teaches in the bandpass filters 132, 140, 152, 156 (figures 7 and 8)

Claim 7 adds into claim 6 “the band pass filter separates a control signal” which Patel teaches in the embedded overhead control signal going through the bandpass filters 132, and 140 (column 8, lines 34-59).

***Allowable Subject Matter***

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5. Claims 8-11, 14-22, and 24-26 are allowed.

The following is an examiner's statement of reasons for allowance: The Prior art fails to teach that, the receiving end amplifying/filtering unit includes a variable amplifier that amplifies a reception RF signal as much as a variable gain according to a control signal, where a closed loop control circuit comprises a coupling unit that branches a transmission output from a final end of the sending end amplifying/filtering unit; and a detection controller that generates a control signal according to a strength of power of the branched transmission output and applying the control signal to the variable gain amplifier.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Due to a new ground of rejection, this action made NON-FINAL.

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***Inquiries***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Huedung Cao  
Patent Examiner



**THUY V. TRAN  
PRIMARY EXAMINER**